National Center *for* Tobacco-Free Kids

AGRICULTURE BRIEFING PAPER 02

TOBACCO & THE ENVIRONMENT

The damaging health and environmental impacts of tobacco begin long before a cigarette is taken out of a packet and lit. From the moment the tobacco seed is planted to the time it is harvested and cured, the health of those who cultivate the crop is constantly put in peril. Health threats include the large amount of pesticides used on the tobacco crop as well as illnesses related to handling of raw tobacco leaves. The pesticides used in tobacco growing also harm the natural environment, as does the deforestation caused by clearing land for tobacco farms and burning trees to provide the heat needed to cure tobacco.

Tobacco's Toxic Toll

The tobacco plant requires a tremendous amount of pesticides to protect it from insects and disease. An instruction leaflet given to tobacco farmers in Kenya by British American Tobacco (BAT), for example, recommends that farmers apply 16 separate applications of pesticides during the three month period before the seedling is transplanted to the field.[1] The heavy and repeated use of pesticides takes a toll on tobacco farmers, many of whom are unaware of the proper safety procedures necessary to handle these chemicals. In addition, many tobacco farmers purchase dumped or banned agro-chemicals from middlemen. Although cheaper than modern brand-name chemicals, they are often scooped out of bulk sacks and packaged in recycled tins with no proper labeling or instructions for use and safe storage.[i] The lack of sufficient labeling is a major cause of accidents.

To give an idea of the devastation that can be caused by pesticide use, a study conducted by the Kenya Medical Research Institute reported 1,000 deaths and 35,000 cases of occupational poisoning on all farms in 1997 (the report did not break down the poisonings by the type of crop). "These cases are just a small tip of what happens on those farms," says the report, which explains that most cases go unreported.[2] In fact, official data on pesticide poisonings in many developing countries likely underestimates the incidence because of a lack of medical personnel in rural areas and because many health professionals don't report the cases of pesticide poisonings that they do see. The Servico Brasileiro de Justica e Paz (SEJUP), a Brazilian nongovernmental organization, estimates that as many as 300,000 people are poisoned by pesticides in Brazil each year, with the number rising each year. The study did not specify what portion of these occurred on tobacco farms.[3]

A survey of tobacco growers in southern Brazil found that 55% were not using the recommended protective clothing, including masks, gloves, boots and long-sleeved or water-repellent overshirts. The farmers cited the high cost of the equipment and the fact that it was not designed for the steamy summer weather. The survey also found that about 48% of family members suffered health problems connected with the use of the chemicals, including persistent headaches and vomiting, and that 42% knew of someone with physical birth defects. Nearly 80% of the families disposed of their waste inadequately, the study noted, throwing the used pesticide containers in the woods or burning them.

Nestor Mahler, a local manager for the international leaf dealer Dimon, says the companies are studying alternatives to pesticides, although they haven't put any into practice. As for complaints about the protective clothing, he says, "What can we do if they don't use it? We counsel the growers, but we have no police powers." The leaf dealers sell the protective suits at $37 each, but that is the equivalent of more than one quarter of the average monthly salary of tobacco farmers in the region.[4]

Common Pesticides Used in Tobacco Cultivation

- Aldicarb is one of the most acutely toxic pesticides registered in the United States. Its lethal toxicity to humans is in the range of one hundredth of a gram. In laboratory animals, aldicarb causes chronic damage to the nervous system, suppresses the immune system and adversely affects fetuses. In human cells, aldicarb causes genetic damage. It is also toxic to birds, fish, honey bees and earthworms. Aldicarb's agricultural formulation contains a toxic contaminant, dichloromethane, that causes damage to hearing, vision, kidneys, and livers and is both carcinogenic and mutagenic.[5]
- Chlorpyrifos is a broad spectrum organophosphate insecticide and the most widely used insecticide in the United States for both household and agricultural purposes. Like all organophosphate insecticides, chlorpyrifos affects the nervous system by inhibiting an enzyme that is important in the transmission of nerve impulses. Symptoms of acute poisoning include headache, nausea, muscle twitching and convulsions. In addition to acute poisonings, exposure to chlorpyrifos products has also been associated with human birth defects. The pesticide has caused genetic damage in human blood and lymph cells and has also been found to affect the male reproductive system. Chlorpyrifos is known to contaminate air, groundwater, rivers, lakes and rainwater, with residues being found up to 25 kilometers from the site of application.[6]
- 1,3-D (1,3-Dichloropropene, also known as Telone) is a highly toxic soil fumigant that causes respiratory problems in humans, as well as skin and eye irritation and kidney damage. A California study of applicators found evidence of kidney damage in nine of the 15 workers tested. 1,3-D causes cancer in laboratory animals and genetic damage in insects and mammal cells. It leaches through soil easily and has been found in U.S. groundwater, drinking water and rainwater.[7]

Toxic Woes in Kenya

"From the day the nursery is laid, to the day the pay cheque is collected, the farmer inhales an assortment of chemicals, which does not do him any good. To make matters worse, the farmer has no protective gloves, gas masks, gum boots or dust-coats during his sad sentence as a tobacco farmer. Thus, at the end of the farming season, the farmer spends all he earned from the crop, sometimes more, to seek medication. At the Kehancha District Hospital, more than 60 per cent of deaths are due to tobacco-related ailments. Infant mortality is also on the increase as are the incidents of unexplained miscarriages, just to mention a few . . . . Tobacco nurseries are situated near water masses, most times at the source. Thus, as the farmer waters his chemical-drenched seedbed, the water flows back to the river carrying with it remnants of such chemicals. It does not need much intelligence to figure out that the same water will be used downstream by communities and their animals. The result is a proliferation of all sorts of ailments assaulting man and beast in the area . . . "

— Testimony of Samson Mwita Marwa,
tobacco farmer and former Kenyan member of parliament,
before the WHO Public Hearings on the
Framework Convention on Tobacco Control[8]

Green Tobacco Sickness

Unlike most food and cash crops, tobacco itself can be toxic to workers. Green tobacco sickness (GTS) is an occupational illness found among workers harvesting tobacco which is caused by dermal (skin) absorption of nicotine from contact with wet tobacco leaves. GTS is characterized by symptoms that may include nausea, vomiting, weakness, headache, dizziness, abdominal cramps, difficulty in breathing, as well as fluctuations in blood pressure and heart rates.[9] Local farmers and health care workers often confuse these symptoms with heat exhaustion or pesticide poisoning, especially if pesticides have recently been applied to the crop. During harvest time, the average field worker may be exposed to up to 600 milliliters of dew or rain on the tobacco plants, the rough equivalent of the nicotine content of 36 cigarettes.[10] This moisture collects on the worker's clothing, effectively wrapping them in a giant contiguous nicotine patch.

The exact number of tobacco workers that are affected by green tobacco sickness is unknown: one study by the United States National Institute for Occupational Safety and Health estimated a crude incidence as 10 cases per 1,000 workers. But a recent study by Sarah Quandt from the Wake Forest University School of Medicine of Hispanic migrant workers in North Carolina suggests that 41% of the workers get green tobacco sickness at least once during harvest season.[11]

TOBACCO & DEFORESTATION

After being harvested as a green leaf, tobacco is cured to preserve it for storage, transport and processing. Curing also gives it the characteristic tobacco taste, aroma and color. A majority of tobacco is flue cured, which entails passing heated air through the harvested leaves.[12] In many developing countries, trees are cut down both to provide fuel for the curing process and for the construction of the curing barns, which typically have to be rebuilt every two to three years. In Southern Africa, researcher Helmut Geist estimates that 140,000 hectares of woodlands are cleared annually to cure tobacco, accounting for 12% of the deforestation in the region. Geist's work was based on extensive aerial and satellite data as well as surveys of 565 tobacco growers in Malawi and Tanzania, both smallholders as well as those on the larger estates. In one region of the Namweran highlands in Malawi, nearly 80% of all the wood cut down is used for tobacco, even though tobacco farmers make up a mere 3% of the farmers in the area. As the surrounding forests get chopped down, women have to go further and further to gather wood for cooking. The impact of this deforestation has become irreversible in many countries.[13]

Although cigarette companies profess to be concerned by tobacco-related deforestation, their tree-planting programs are often poorly designed and not commensurate with the scale of the problem. BAT's website admits that wood is used in two-thirds of company growing operations in 20 countries and that many of these use wood for half or more of their curing. The company claims that they have run ambitious afforestation programs since the 1970s, sponsoring and promoting the planting of 267,000 hectares of managed, renewable woodlands around the world in the last three decades. To put this into perspective, however, this is equal to the area of woodlands chopped down just in Southern Africa for tobacco in only two years.

Moreover, BAT admits that their afforestation programs do not necessarily take place in the same areas where farmers are cutting trees down. They claim however that as a condition of contract that farmers who use wood become 'self-sufficient' by planting trees to supply their own fuel needs.[14] They do not mention what kind of trees are planted nor what percentage of trees make it to maturity. In fact, many tree-planting programs in tobacco growing areas have failed because they follow the dictum of "cut a tree, plant a tree". But given that only a small percentage of these seedlings survive this means that the total forest cover decreases over time. According to Samson Mwita Marwa, a tobacco farmer and former member of Parliament from the Kuria district in Kenya, "The lands are increasingly becoming bare and barren, unproductive, caked, ugly and blistering. BAT claims to be engaged in reforestation programmes. I am yet to see a single mature tree that BAT has planted in Kuria district. In any case, the rate of deforestation is far too fast to be equal to the rate of reforestation."[15]

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[1] *R.J.A. Goodland, C. Watson and G Ledec,* Environmental Management in Tropical Agriculture, *(Colorado: Westview Press, 1984).*
[2] *Judith Achieng, "Pesticides Pose Risk To African Farmers,"* Interpress Service, *16 February 1998.*
[3] *Ibid.*
[4] *"Poisonings in Brazil,"* Global Pesticide Campaigner, *Pesticide Action Network, March 1997.*
[5] *Katherine Ellison, "Tobacco Farming Central Shifts to South America,"* Miami Herald, *29 June 1997.*
[6] *C. Cox, "Aldicarb,"* Journal of Pesticide Reform, *Summer 1992.*
[7] *C. Cox,"Chlorpyrifos Factsheet, Part 2,"* Journal of Pesticide Reform, *Spring 1995.*
[8] *C. Cox,"1,3-Dichloropropene,"* Journal of Pesticide Reform, *Spring 1992.*
[9] *Submitted August 17, 2000; http://www-nt.who.int/whosis/statistics/fctc/Submissions/F6360629.pdf*
[10] *"Southeast Center Studies Ways to Prevent Green Tobacco Sickness,"* NIOSH Agricultural Health & Safety Center News, *4 August 1996.*
[11] *S. Gehlbach et al., "Nicotine Absorption by Workers Harvesting Green Tobacco,"* The Lancet, *1975, no. 1.*
[12] *Sarah Quandt et al., "Migrant Farmworkers and Green Tobacco Sickness: New Issues for an Understudied Disease,"* American Journal of Industrial Medicine, *February 2000.*
[13] *International Tobacco Growers Association (ITGA), "Curing Tobacco - The Issues,"January 1998; http://www.tobaccoleaf.org/publications/infot6.htm#Flue*
[14] *Helmut Geist, "How Tobacco Farming Contributes to Tropical Deforestation," in* The Economics of Tobacco Control: Towards an Optimal Policy Mix, *Abedian et al. eds. (Cape Town: Applied Fiscal Research Center, 1998).*
[15] *http://www.bat.com/bat/bathome.nsf/AllDocids/570BA39D70E899838025695000473D6D?opendocument*
[16] *Testimony submitted on 17 August 2000 before the WHO Public Hearings on the FCTC; http://www-nt.who.int/whosis/statistics/fctc/Submissions/F6360629.pdf*